

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 09-247737  
(43)Date of publication of application : 19.09.1997

(51)Int.Cl.

H04Q 7/34

(21)Application number : 08-047187

(71)Applicant : ROOKASU:KK  
MATSUSHITA ELECTRIC IND CO LTD

(22)Date of filing : 05.03.1996

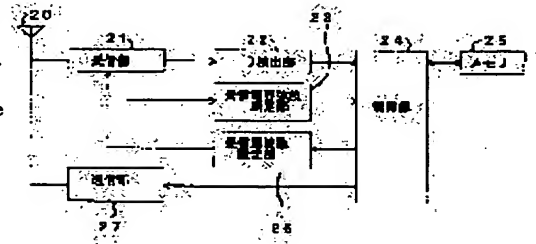
(72)Inventor : HIRANO HIROHISA  
KAMISHIMA HIROAKI  
HORI MASATOMO

## (54) POSITION INFORMATION DETECTION SYSTEM

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To surely detect the current position of a mobile terminal equipment and to improve the detection accuracy by allowing a mobile terminal to receive the electric field strength of a base station control channel of other enterprises other than that of a concerned enterprise and using the result in common.

**SOLUTION:** A mobile terminal equipment receives a radio wave for each base station and an ID detection section 22 detects the identification code of each base station from a signal demodulated by a reception section 21 and a measurement section 23 measures a reception electric field strength. A control section 24 stores position information in pairs of a reception electric field strength in excess of a prescribed threshold level as to each base station and an identification code of the corresponding base station to a memory 25. Furthermore, the control station 24 uses a frequency setting section 26 to revise the frequency of radio wave of base stations of other enterprises and receives the radio wave and stores position information to the memory 25 and when data pairs reach a required number, a transmission section is used to send the position information to a position management station via a prescribed base station. The position management station refers to a database on the position information to discriminate the position of the mobile terminal equipment through calculation.



## LEGAL STATUS

[Date of request for examination] 20.11.2000  
[Date of sending the examiner's decision of rejection] 08.10.2002  
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]  
[Date of final disposal for application]  
[Patent number]  
[Date of registration]  
[Number of appeal against examiner's decision of rejection]  
[Date of requesting appeal against examiner's decision of rejection]  
[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

**Japanese Publication for Unexamined Patent Application**

**No. 247737/1997 (Tokukaihei 9-247737)**

A. Relevance of the Above-identified Document

This document has relevance to claims 1 and 20 of the present application.

B. Translation of the Relevant Passages of the Document

[CLAIMS]

[Claim 1]

A positional information detection system including a wireless mobile terminal, a plurality of base stations communicating with the wireless mobile terminal, and a position management station performing transmission and reception with the wireless mobile terminal via the base station,

the wireless mobile terminal comprising:

an ID detection section which detects an identification code of each base station from a received signal;

an electric field strength measurement means which measures a reception electric field strength of the base station;

a frequency setting section which sets a reception frequency;

a memory which stores positional information which is a pair of data including the base station identification code and a reception electric field value exceeding a predetermined threshold value;

a transmission section which generates a signal to be transmitted to the base station and transmits the generated signal to the base station; and

a control section which, when the number of positional information in the memory does not reach a number required to identify a position of the wireless mobile terminal, changes the reception frequency to receive a base station control channel of other enterprise, stores in the memory the positional information which is a pair of data including the base station identification code and a reception electric field value exceeding a predetermined threshold value, in addition to an already-stored positional information, and, when the number of positional information in the memory reach a number required to identify a position of the wireless mobile terminal, transmits the positional information in the memory via the transmission section to the base station,

wherein:

the position management station includes a position calculation section which detects the position of the

wireless mobile terminal by referring to database accumulating geographical positional information of a plurality of enterprises on the basis of the positional information transmitted via the base station from the wireless mobile terminal.

[0011]

[MEANS FOR SOLVING THE PROBLEM]

In order to solve the above problem, in a positional information detection system of the present invention, a mobile terminal includes: an ID detection section which detects an identification code of each base station from a received signal; an electric field strength measurement means which measures a reception electric field strength of the base station; a frequency setting section which sets a reception frequency; a memory which stores positional information which is a pair of data including the base station identification code and a reception electric field value exceeding a predetermined threshold value; a transmission section which generates a signal to be transmitted to the base station and transmits the generated signal to the base station; and a control section which, when the number of received positional information in the memory does not reach a number required to identify the position of the wireless mobile terminal, changes the reception frequency to receive a

base station control channel of other enterprise, stores in the memory the positional information which is a pair of data including the base station identification code and a reception electric field value exceeding a predetermined threshold value, in addition to an already-stored positional information, and, when the number of the stored data pairs reach a plural number of positional information sets required to identify the position of the wireless mobile terminal, transmits the positional information in the memory via the transmission section to the base station, and the position management station includes a position calculation section which detects the position of the mobile terminal by referring to database accumulating geographical positional information of a plurality of enterprises on the basis of the positional information transmitted via the base station from the mobile terminal.

[0018]

A control section 24 stores in a memory 25 positional information which is a pair of data including a reception electric field value exceeding a predetermined threshold value among reception electric field values of base stations outputted from a reception electric field strength measurement section 23, and a base station identification code corresponding to the reception electric field value

outputted from an ID detection section 22. Further, in the case of one or two sets of positional information stored in the memory 25, the accuracy of position decreases since a geographical scope to identify the position of a mobile terminal becomes broad. Because of this, the control section 24 receives radio waves from a base station of other enterprise with their frequencies changed by the reception frequency setting section 26, and stores in the memory 25 positional information which is a pair of data including a base station identification code outputted from the ID detection section 22 and a reception electric field value exceeding a predetermined threshold value among the reception electric field values outputted from the reception electric field strength measurement section 23.

[0019]

When the number of data pairs stored in the memory 25 reaches the number of positional information sets required to identify the position of a mobile terminal (e.g. when three or more positional information sets are collected), the control section 24 outputs positional information in the memory 25 to a transmission section 27. The transmission section 27 converts the received positional information into data of a prescribed baseband format and modulates the data into a wireless

transmission signal, and the wireless transmission signal is transmitted to a predetermined base station (e.g. base station securing a communication line) in a general call area 4. A signal of the mobile terminal 1 received by the base station is transmitted from a control station 5 to a position management station via a line 30.